

## WHAT IS CLAIMED IS:

1           1.    A voltage-controlled oscillator discrete-time  
2 amplitude control system comprising:

3               a voltage-controlled oscillator; and  
4               a control circuit sensing an amplitude of an  
5 output of the voltage-controlled oscillator and adjusting  
6 operation of the voltage-controlled oscillator, if  
7 necessary, at discrete intervals.

1           2.    The voltage-controlled oscillator discrete-time  
2 amplitude control system according to claim 1, further  
3 comprising:

4               a bias circuit setting at least one of a voltage  
5 bias and a current bias for the voltage-controlled  
6 oscillator under control of the control circuit.

1           3.    The voltage-controlled oscillator discrete-time  
2 amplitude control system according to claim 2, wherein  
3 control of the voltage bias or the current bias adjusts the  
4 amplitude of the output of the voltage-controlled  
5 oscillator.

1           4.    The voltage-controlled oscillator discrete-time  
2    amplitude control system according to claim 2, wherein the  
3    control circuit further comprises:

4                a comparator periodically comparing the amplitude  
5    of the output of the voltage-controlled oscillator to a  
6    reference amplitude; and

7                logic increasing or decreasing the voltage bias  
8    or the current bias based upon an output signal of the  
9    comparator responsive to comparison of the amplitude of the  
10   output of the voltage-controlled oscillator to the  
11   reference amplitude.

1           5.    The voltage-controlled oscillator discrete-time  
2    amplitude control system according to claim 1, wherein the  
3    control circuit adjusts operation of the oscillator only  
4    during a calibration phase, holding operation of the  
5    voltage-controlled oscillator constant after completion of  
6    the calibration phase.

1           6.    The voltage-controlled oscillator discrete-time  
2    amplitude control system according to claim 1, wherein the  
3    voltage-controlled oscillator produces a differential  
4    output signal.

1           7.    A wireless transmitter including the voltage-  
2   controlled oscillator discrete-time amplitude control  
3   system according to claim 1, the wireless transmitter  
4   further comprising:

5                a low noise amplifier operating on a wireless  
6   signal in conjunction with the voltage-controlled  
7   oscillator; and

8                a modulator operating on the wireless signal.

1           8.    A wireless communications system including the  
2   wireless transmitter according to claim 7, the wireless  
3   communications system further comprising:

4                a receiver receiving the wireless signal.

1           9.    A wireless transceiver including the wireless  
2   transmitter according to claim 7, the wireless transceiver  
3   further comprising:

4                a receiver operating on a second wireless signal  
5   forming a communications channel with the wireless signal.

1           10. A method of discrete-time amplitude control  
2 system for a voltage-controlled oscillator, the method  
3 comprising:

4           operating a voltage-controlled oscillator; and  
5           sensing an amplitude of an output of the voltage-  
6 controlled oscillator and adjusting operation of the  
7 voltage-controlled oscillator, if necessary, at discrete  
8 intervals.

1           11. The method according to claim 10, further  
2 comprising:

3           setting at least one of a voltage bias and a  
4 current bias for the voltage-controlled oscillator under  
5 control of the control circuit.

1           12. The method according to claim 11, wherein control  
2 of the voltage bias or the current bias adjusts the  
3 amplitude of the output of the voltage-controlled  
4 oscillator.

1           13. The method according to claim 11, further  
2 comprising:

3                 periodically comparing the amplitude of the  
4 output of the voltage-controlled oscillator to a reference  
5 amplitude; and

6                 increasing or decreasing the voltage bias or the  
7 current bias based upon an output signal of the comparator  
8 responsive to comparison of the amplitude of the output of  
9 the voltage-controlled oscillator to the reference  
10 amplitude.

1           14. The method according to claim 10, further  
2 comprising:

3                 adjusting operation of the oscillator only during  
4 a calibration phase; and

5                 holding operation of the voltage-controlled  
6 oscillator constant after completion of the calibration  
7 phase.

1           15. The method according to claim 10, wherein  
2 operation of the voltage-controlled oscillator produces a  
3 differential output signal.

1           16. A voltage-controlled oscillator discrete-time  
2 amplitude control system comprising:

3           a voltage-controlled oscillator producing a  
4 differential output signal;

5           a control circuit sensing an amplitude of the  
6 output signal and generating a control signal for  
7 controlling biasing of the voltage-controlled oscillator;  
8 and

9           a biasing circuit biasing the voltage-controlled  
10 oscillator based upon the control signal,

11           wherein the biasing of the voltage-controlled  
12 oscillator is adjusted, if necessary, at a predetermined  
13 point within a recurring period.

1           17. The system according to claim 16, wherein  
2 adjustment of the biasing of the voltage-controlled  
3 oscillator sets the amplitude of the output signal.

1           18. The system according to claim 16, wherein the  
2 biasing circuit further comprises:

3           a voltage bias circuit for setting a voltage bias  
4 of the voltage controlled oscillator; and

5           a current bias circuit setting a current through  
6 the voltage-controlled oscillator.

1           19. The system according to claim 16, wherein the  
2 voltage-controlled oscillator further comprises:

3                 an inductive-capacitive tank circuit including a  
4 voltage-variable capacitance;

5                 a voltage divider coupled to output nodes of the  
6 tank circuit; and

7                 a coupled-emitter, cross-coupled pair of  
8 transistors coupled to the voltage divider and providing  
9 negative transconductance compensating for losses within  
10 the tank circuit.

1           20. The system according to claim 16, wherein setting  
2 of the amplitude of the output signal eliminates process  
3 and temperature dependencies of the amplitude.